Tennessee Pollution Prevention Partnership Success Story

GM-Spring Hill
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Solvent Saver Valve Technology Reduces Air Emissions and Hazardous Waste

The Member

GM-Spring Hill Manufacturing Facility is a highly integrated automotive manufacturing and assembly complex of about seven million square feet. The facility produces the Saturn VUE, VUE Red Line, VUE Green Line (small sport utility vehicles), Saturn ION, ION Red Line (sedan and coupes), and Ecotec engines (2.0L Turbo, 2.2L and 2.4L 4-cylinder engines).

The Story

GM Spring Hill realized a significant reduction in organic solvent usage associated with frequent cleaning and purging of clearcoat paint lines and equipment. This was done by installing "solvent saver" valves on some robots that spray clearcoat (top layer) paint onto vehicle surfaces.

When purging and cleaning clearcoat paint lines, solvent saver valves push air in addition to solvent. They are equipped with one valve to regulate the air and one for the solvent. As a result, many bubbles are formed, which increases the surface area for the solvent and therefore reduces the amount of solvent required to sufficiently clean paint lines.

GM Spring Hill had been following the progress made in developing the technology to bring the solvent/ air combination theory to the paint manufacturing environment. A key to success has been working with a company that developed a method of regulating the air and the solvent at the same pressure.

In order to evaluate the effectiveness of the solvent saver valves, a series of experiments were performed on the clearcoat application equipment. Paint maintenance and engineering team members performed a series of tests on robots to determine the optimal purge cycle with the solvent saver valve.

The Success

Results proved that the solvent saver valve reduced purge solvent usage by 70% on some applicator robots. Financial savings are over $60,000 per year, primarily from reduced solvent purchases.

This project was initiated via an employee suggestion program, and involved cross-functional team collaboration. The team pursued innovation by keeping up with advancements in valve technology through site suppliers.

The Pollution Prevented

- Reduction in Volatile Organic Carbon (VOC) emissions by twenty-five (25) tons per year.
- Reduction in gallons of solvent used (and disposed as hazardous waste) by 13,000 gallons per year.

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